

REMARKS

The Specification as been objected to for failure to comply with the requirements of 37 C.F.R. §1.821(a)(1) and (a)(2). The Examiner has indicated that the Specification includes nucleotide sequences that are not identified by sequence numbers, two of which are on page 10. Enclosed herewith is a copy of an Amendment previously filed on April 17, 2003, as the Sequence Listing does not match the Amendment that was made, also enclosed herewith is a new Sequence Listing, along with a new disk and a statement that the information is the same and no new matter has been incorporated.

The Specification has been objected to due to informalities, the Specification as been amended to obviate the Examiner's objections.

Claims 1, 2, 4-6 and 9-17 have been rejected under 35 U.S.C. §112, first paragraph.

The Examiner's rejection is respectfully traversed.

The Examiner has indicated that in order to practice the invention, the skilled artisan requires: (a) a bacterial cell that is invasive for fish, such that the DNA vector can be transferred into the fish and the immune system response induced; (b) a plasmid DNA sequence that is capable of replicating in the bacterial cell, and which can express antigenic protein in the target fish upon its transfer. (Page 6, lines 6-10 of the Office Action). The Applicants agree with assertion (b) of the Examiner, however the Applicant does not agree with (a). The experimental data indicates that there is no need for a bacterial cell that is invasive for fish to allow the transfer of the plasmid DNA vector into the fish. The Applicants have shown that immersion in killed and live E. coli, which does not have the ability to invade fish, by immersion results in the delivery of DNA to several fish tissues, including liver and kidney. The exact mechanisms that result in non-

specific uptake of particles and bacteria is unknown, but may include non-specific phagocytosis of the bacteria by cells present in the gills, which are in direct contact with the large amounts of bacteria present in the water during immersion, or mucosal surfaces (mouth, stomach, intestine which are in contact with the bacteria when fish ingest water while immersed) of the fish. Therefore, the ability of the bacteria to invade the target cell, as seen in mammals, is not a requirement for the delivery of DNA to fish.

The examples that the Applicants have provided include an example of a bacterium that is non-pathogenic to fish (*E. coli*). *E. coli* is only a pathogen to mammals, and no infections of fish by *E. coli* have ever been recorded. Furthermore, *E. coli* is not found as part of the normal bacterial community of fish intestines, most probably due to the fact that *E. coli* requires temperatures of 37°C to grow, which very few fish, as cold-blooded organisms, experience. In summary, any bacterial species could be used in this case, when killed, would provide a coating to DNA that prevents degradation from nucleases present in the water and in the fish mucosal surfaces; and serve as a vehicle that enhances uptake of the DNA by providing an appropriate size to stimulate non-specific phagocytosis.

Claims 1-6 and 9-17 have been rejected under 35 U.S.C. §112, second paragraph, as being indefinite.

The Examiner's rejections are respectfully traversed.

Claims 1 and 9 have been amended to obviate the Examiner's rejection.

Claims 2, 10 and 13 have been rejected due to the recitation to the phrase "group of finfish". Finfish is a general term used for fish having a fin as opposed to shellfish. Attached hereto are a number of definitions obtained from the internet where finfish is defined as an aquatic


vertebrate of the superclass Pisces, or a true fish, distinguished from a shellfish. Thus, this is a common word known to those skilled in the art and thus, should be sufficient in the claim.

The claims have been amended to obviate the remaining 35 U.S.C. §112, second paragraph rejections.

In view of the foregoing, it is believed that the amended claims and the claims dependent there from are in proper form. Thus, claims 1-17 should be considered allowable.

The application is now considered to be in condition for allowance, and an early indication of same is earnestly solicited.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read 'Arlene J. Powers', is written over a horizontal line.

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